What is claimed is:

1. An interconnect structure, comprising:

a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and a lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire;

an upper level wire having a side and a bottom, said upper level wire comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire; and

said upper conductive liner in contact with said lower core conductor and also in contact with said lower conductive liner in a liner-to-liner contact region.

2. The interconnect structure of claim 1, wherein said lower level wire is formed by a damascene process in a lower level dielectric and said upper level wire is formed by a damascene process in an upper level dielectric.

3. The interconnect structure of claim 1, wherein said upper and lower core conductors are selected from the group

consisting of copper, aluminum, aluminum-copper and aluminum-copper-silicon.

4. The interconnect structure of claim 1, wherein said upper and lower conductive liners are selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten and combinations thereof.

5. The interconnect structure of claim 1, wherein said lower conductive liner includes an upper edge having an inner surface, an outer surface, and a top surface and said upper conductive liner contacts one or more of said inner, outer and top surfaces to form said liner-to-liner contact region.

6. The interconnect structure of claim 1, wherein said liner-to liner contact region comprises a first portion co-extensive with said lower conductive liner on a portion of a first side of said lower level wire under said upper level wire.

7. The interconnect structure of claim 6, wherein said liner-to liner contact region further comprises a second portion co-extensive with said lower conductive liner on a portion of a second side of said lower level wire under said upper level wire.

8. The interconnect structure of claim 7, wherein said liner-to-liner contact region further comprises a third portion co-extensive with said lower conductive liner on an end of said lower level wire under said upper level wire.

9. The interconnect structure of claim 2, wherein said first and second dielectrics are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond, polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.

10. An interconnect structure, comprising:

a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and an lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire;

an upper level wire having a side and a bottom and a via integrally formed in the bottom of said upper level wire, said via have a side and a bottom, said upper level wire and said via each comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire and on the side and bottom of said via; and

said upper conductive liner on the bottom of said via in contact with said lower core conductor and also in contact with said lower conductive liner in a liner-to-liner contact region.

11. The interconnect structure of claim 10, wherein said lower level wire is formed by a damascene or dual damascene process in a lower level dielectric and said upper level wire is formed by a dual-damascene process in an upper level dielectric.

12. The interconnect structure of claim 10, wherein said upper and lower core conductors are selected from the group consisting of copper, aluminum, aluminum-copper and aluminum-copper-silicon.

13. The interconnect structure of claim 10, wherein said upper and lower conductive liners are selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten and combinations thereof.

14. The interconnect structure of claim 10, wherein said lower conductive liner includes an upper edge having an inner surface, an outer surface, and a top surface and said upper conductive liner on the bottom of said via contacts one or more of said inner, outer and top surfaces to form said liner-to-liner contact region.

15. The interconnect structure of claim 10, wherein said liner-to liner contact region comprises a first portion co-extensive with said lower conductive liner on a portion of a first side of said lower level wire under said via.

16. The interconnect structure of claim 15, wherein said liner-to liner contact region further comprises a second portion co-extensive with said lower conductive liner on a portion of a second side of said lower level wire under said via.

17. The interconnect structure of claim 16, wherein said liner-to-liner contact region further comprises a third portion co-extensive with said lower conductive liner on an end of said lower level wire under said via.

18. The interconnect structure of claim 10, wherein said liner-to liner contact region comprises a first portion co-extensive with said lower conductive liner on a portion of a first side of said lower level wire under said via and a second portion co-extensive with said lower conductive liner on a portion of an end of said lower level wire under said via.

19. The interconnect structure of claim 11, wherein said first and second dielectrics are selected from the group consisting of silicon oxide, silicon nitride, diamond,

fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond, polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.

20. An interconnect structure, comprising:

a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and an lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire;

an upper level wire having a side and a bottom and an array of vias integrally formed in the bottom of said upper level wire, each via of said array of vias having a side and a bottom, said upper level wire and each via comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire and on the side and bottom of each via; and

said upper conductive liner on the bottom of each via of a first portion of said array of vias in contact with said lower core conductor and each via of a second portion of said array of vias in contact with said lower core conductor and also in contact with said lower conductive liner in liner-to-liner contact regions.

21. The interconnect structure of claim 20, wherein said lower conductive liner includes an upper edge having an inner surface, an outer surface, and a top surface and said

upper conductive liner on the bottom of vias of said second portion of said array of vias contact one or more of said inner, outer and top surfaces to form said liner-to-liner contact region.

22. The interconnect structure of claim 20, wherein said liner-to liner contact region comprises first portions co-extensive with said lower conductive liner on portions of first sides of said lower level wire under vias of said second portion of said array of vias.

23. The interconnect structure of claim 22, wherein said liner-to liner contact region further comprises second portions co-extensive with said lower conductive liner on portions of second sides of said lower level wire under vias of said second portion of said array of vias.

24. The interconnect structure of claim 23, wherein said liner-to-liner contact region further comprises a third portion co-extensive with said lower conductive liner on an end of said lower level wire under vias of said second portion of said array of vias.

25. An interconnect structure, comprising:

a lower level wire having a side and a bottom and one or more integral extensions each extension having a side and a bottom , said lower level wire and extensions comprising a lower core conductor and an lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire and said extensions;

an upper level wire having a side and a bottom and an array of vias integrally formed in the bottom of said upper level wire, each via of said array of vias having a side and a bottom, said upper level wire and each via comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire and on the side and bottom of each via; and

said upper conductive liner on the bottom of each said via of a first portion of said array of vias in contact with said lower core conductor of said lower level wire and a second portion of said array of vias in contact with said lower core conductor of said extensions and also in contact with said lower conductive liner of said extensions in liner-to-liner contact regions.

26. The interconnect structure of claim 25, wherein said lower conductive liner on said extension includes an upper edge having an inner surface, an outer surface, and a top surface and said upper conductive liner on the bottom of vias of said second portion of said array of vias contact one or more of said inner, outer and top surfaces to form said liner-to-liner contact region.

27. The interconnect structure of claim 25, wherein said liner-to liner contact region comprises first portions co-extensive with said lower conductive liner on portions of first sides of said extensions of said lower level wire under vias of said second portion of said array of vias.

28. The interconnect structure of claim 27, wherein said liner-to liner contact region further comprises second portions co-extensive with said lower conductive liner on portions of second sides of said extensions of said lower level wire under vias of said second portion of said array of vias.

29. The interconnect structure of claim 28, wherein said liner-to-liner contact region further comprises a third portion co-extensive with said lower conductive liner on an end of said lower level wire under vias of said second portion of said array of vias.

30. An interconnect structure, comprising:

a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and a lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire;

one or more dielectric pillars formed in said lower level wire, said lower conductive liner on sides of said dielectric pillars;

an upper level wire having a side and a bottom, said upper level wire comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire; and

said upper conductive liner in contact with said lower core conductor and also in contact with said lower conductive liner on the sides of said dielectric pillars in liner-to-liner contact regions.

31. An interconnect structure, comprising:

a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and an lower conductive liner, said lower conductive liner on the side and the bottom of said lower level wire;

one or more dielectric pillars formed in said lower level wire, said lower conductive liner on sides of said dielectric pillars;

an upper level wire having a side and a bottom and one or more vias integrally formed in the bottom of said upper level wire, each via having a side and a bottom, said upper level wire and each via comprising an upper core conductor and an upper conductive liner, said upper conductive liner on the side and the bottom of said upper level wire and on the side and bottom of each via; and

said upper conductive liner on the bottom of at least a portion of said one or more vias in contact with said lower core conductor and at least a portion of said one or more vias in contact with said lower conductive liner on said side of at least a portion of said one or more dielectric pillars in liner-to-liner contact regions.

32. The interconnect structure of claim 31, wherein said lower conductive liner on the side of said one or more dielectric pillars includes an upper edge having an inner surface, an outer surface, and a top surface and said upper conductive liner on the bottom of vias of said second portion of said array of vias contact one or more of said inner, outer and top surfaces to form said liner-to-liner contact region.

33. The interconnect structure of claim 31, wherein said liner-to liner contact region comprises first portions co-extensive with said lower conductive liner on portions of first sides of said dielectric pillars under said vias.

34. The interconnect structure of claim 33, wherein said liner-to liner contact region further comprises second portions co-extensive with said lower conductive liner on portions of second sides of said dielectric pillars under said vias.

35. The interconnect structure of claim 34, wherein said liner-to-liner contact region further comprises a third

portion co-extensive with said lower conductive liner on portions of third sides of said dielectric pillars under said vias.

36. A method of fabricating an interconnect structure, comprising:

providing a substrate;

forming, on said substrate, a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and a lower conductive liner, said lower conductive liner formed on the side and the bottom of said lower level wire;

forming an upper level wire having a side and a bottom, said upper level wire comprising an upper core conductor and an upper conductive liner, said upper conductive liner formed on the side and the bottom of said upper level wire; and

aligning said lower level wire with said upper level wire such that said upper conductive liner contacts said lower core conductor and also contacts said lower conductive liner to form a liner-to-liner contact region.

37. The method of claim 36, wherein said lower level wire is formed by a damascene process in a lower level dielectric layer and said upper level wire is formed by a damascene process in an upper level dielectric layer.

38. The method of claim 36, wherein said upper and lower core conductors are selected from the group consisting of copper, aluminum, aluminum-copper and aluminum-copper-silicon.

39. The method of claim 36, wherein said upper and lower conductive liners are selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten and combinations thereof.

40. The method of claim 37, wherein said first and second dielectrics are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond, polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.

41. A method of fabricating an interconnect structure, comprising:

providing a substrate;

forming, on said substrate, a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and an lower conductive liner, said lower conductive liner formed on the side and the bottom of said lower level wire in a lower dielectric layer;

forming an upper level wire having a side and a bottom and a via integrally formed in the bottom of said upper level wire, said via having a side and a bottom, said upper level wire and said via each comprising an upper core conductor and an upper conductive liner, said upper conductive liner formed on the side and the bottom of said upper level wire and on the side and bottom of said via; and

aligning upper level wire with said lower level wire such that said upper conductive liner on the bottom of said via contacts said lower core conductor and also contacts said lower conductive liner to form a liner-to-liner contact region.

42. The method of claim 41, wherein said lower level wire is formed by a damascene process in a lower level dielectric layer and said upper level wire is formed by a damascene process in an upper level dielectric layer.

43. The method of claim 41, wherein said upper and lower core conductors are selected from the group consisting of copper, aluminum, aluminum-copper and aluminum-copper-silicon.

44. The method of claim 41, wherein said upper and lower conductive liners are selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten and combinations thereof.

45. The method of claim 41, wherein said first and second dielectrics are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond,

polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.

46. A method of forming an interconnect structure, comprising:

providing a substrate;

forming, on said substrate, a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and a lower conductive liner, said lower conductive liner formed on the side and the bottom of said lower level wire;

forming one or more dielectric pillars in said lower level wire, said lower conductive liner formed on sides of said dielectric pillars;

forming an upper level wire having a side and a bottom, said upper level wire comprising an upper core conductor and an upper conductive liner, said upper conductive liner formed on the side and the bottom of said upper level wire; and

aligning said upper level wire with said lower level wire such that said upper conductive liner contacts said lower core conductor and also contacts said lower conductive liner on the sides of said dielectric pillars to form liner-to-liner contact regions.

47. A method of fabricating an interconnect structure, comprising:

providing a substrate;

forming, on said substrate, a lower level wire having a side and a bottom, said lower level wire comprising a lower core conductor and an lower conductive liner, said lower conductive liner formed on the side and the bottom of said lower level wire;

forming one or more dielectric pillars in said lower level wire, said lower conductive liner formed on sides of said dielectric pillars;

forming an upper level wire having a side and a bottom and one or more vias integrally formed in the bottom of said upper level wire, each via having a side and a bottom, said upper level wire and each via comprising an upper core conductor and an upper conductive liner, said upper conductive liner formed on the side and the bottom of said upper level wire and on the side and bottom of each via; and

aligning said upper level wire to said lower level wire such that said upper conductive liner on the bottom of at least a portion of said one or more vias contacts said lower core conductor and at least a portion of said one or more

vias contacts said lower conductive liner on said side of at least a portion of said one or more dielectric pillars to form liner-to-liner contact regions.

48. The method of claim 47, wherein said lower level wire is formed by a damascene process in a lower level dielectric layer and said upper level wire is formed by a dual-damascene process in an upper level dielectric layer.

49. The method of claim 47, wherein said upper and lower core conductors are selected from the group consisting of copper, aluminum, aluminum-copper and aluminum-copper-silicon.

50. The method of claim 47, wherein said upper and lower conductive liners are selected from the group consisting of tantalum, tantalum nitride, titanium, titanium nitride, tungsten and combinations thereof.

51. The method of claim 47, wherein dielectric pillars are formed from material selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped

silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond, polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.

52. The method of claim 48, wherein said first and second dielectrics are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene N, paralyene F, polyolefin, poly-naphthalene, amorphous Teflon, SILK™, black diamond, polymer foam, aerogel, air, dielectric gases, a partial vacuum and combinations thereof.